Thesis/
Reports
Hayward,
G.D.

HABITAT REQUIREMENTS AND DISTRIBUTION OF THE BOREAL OWL IN CENTRAL IDAHO

COOP AGREE
UNIV. of IDAHO
RMO Oxley → Dan Winn
TO: Wildlife Library
FROM: WL
4D-40

HABITAT REQUIREMENTS AND DISTRIBUTION OF THE BOREAL OWL IN CENTRAL IDAHO

A Progress Report to the

Intermountain Forest and Range

Experiment Station

Gregory D. Hayward
Research Associate,

Patricia H. Hayward
Research Assistant

and

Edward O. Garton
Associate Professor

Wildlife Resources
College of Forestry, Wildlife and Range Sciences
University of Idaho
Moscow, Idaho 83843
(208) 885-6434

National FS Library
USDA Forest Service

MAY 12 2009

240 W Prospect Rd
Fort Collins CO 80526

cc: Idaho Forests

Information gathered during our first year of field work studying the boreal owl has added more to the data base than all previous work on the species in the northern Rockies. Prior to 1981, documented breeding season sightings for Rocky Mountain boreal owls south of Canada and north of Colorado, consisted of seven accounts (Ryder, R. A. pers comm. 1981). During 1984 over twice this number of territorial male boreal owls were located outside the River of No Return Wilderness (RNRW). The number of documented nest sites increased four-fold during our 1984 studies.

Research efforts outside the RNRW improved our understanding of the geographic distribution of boreal owls. Intensive studies within the wilderness area provided information on seasonal habitat use, home range size, food habits, and breeding biology.

This report describes the information collected during the first year of field work. It would be premature to draw any conclusions from the data collected in a single year, but we are optimistic that the three-year course of the study will provide an excellent basis for understanding the ecology of boreal owls, for evaluating the impact of natural resource management activities on boreal owls, and for managing boreal owl populations in the northern Rockies.

Numerous individuals and organizations contributed to the success of our first field season. The U. S. Forest Service Intermountain Forest and Range Experiment Station, Idaho Department of Fish and Game, and the North American Bluebird Society contributed funds. Without the support from each of these organizations we could not have accomplished all that we did.

Forest Service biologists, Fish and Game personnel and other volunteers surveyed for boreal owls during harsh winter conditions. Their efforts are greatly appreciated. Ron Escano coordinated all survey efforts in Region I and compiled all results from that region saving us a tremendous amount of effort and paperwork. Clem Pope, Ed Allan, and Rolf and Margaret Goerke of the Payette National Forest provided valuable assistance in the logistics of wilderness fieldwork. We thank Dr. Russ Ryker, Project Leader, Intermountain Forest and Range Experiment Station who offered suggestions on study methods and assisted in establishing field camps. The United States Army loaned the project a night vision device to aid in observing foraging owls. Finally, we thank the Duracell Corporation and TDK tapes for donating substantial quantities of batteries and cassette tapes, respectively.

OBJECTIVES

1). Determine the habitat requirements of the boreal owl in central Idaho during the breeding period.

2). Survey areas of suitable habitat outside the River of No Return Wilderness to determine the extent of the boreal owl's distribution in central Idaho.

3). Evaluate the potential influence of land management activities such as timber harvest and fire management on boreal owl populations.

4). Determine the distribution and estimate the density of boreal owls within the RNRW.

5). Establish the season of territorial occupancy, degree of site tenacity and year-to-year constancy in breeding of boreal owls in the wilderness.

PROGRESS

Distribution Outside the RNRW

Surveys for boreal owls were coordinated with numerous cooperators throughout the Northern Rockies in Utah, Wyoming, Idaho, and Montana. An owl survey package including a cassette tape for playback of owl vocalizations, data forms, and description of methodology was sent to over 65 cooperators (the majority being U.S. Forest Service wildlife biologists). The boreal owl surveys, intended to determine the geographic distribution of the species and range of habitats occupied, sampled areas from 1400 to 10,000 feet elevation and habitats from the Lower Transition to Upper Hudsonian life zones. Over 75 surveys from trucks, snowmobiles and X-country skies covered 617 miles and located boreal owls at 19 sites on seven National Forests and in Grand Teton National Park (Fig. 1). Boreal owl locations ranged from 5200 to 7300 feet elevation and were in spruce-fir, lodgepole pine (Pinus contorta) and Douglas fir (Pseudotsuga menziesii) forest types. Vegetation analysis to determine forest stand structure and habitat types at these boreal owl locations will be conducted in 1985 after more owls are located.

Owl surveys were not conducted on seven Forests in Region IV and six Forests in Region I. Future survey efforts on these Forests are expected to further expand the known distribution of

boreal owls since biologists located boreal owls on 64% of surveyed Forests in 1984.

Intensive Ecological Investigation in the RNRW

Boreal owls in the RNRW were studied continuously from 28 January 1984 through 4 August 1984 except during a short period in late April and early May. Data were also gathered during the last week of September. Two study sites were established at Chamberlain Basin and Cold Meadows Forest Service facilities. Two biologists worked together during the field investigation spending from two weeks to a month at each study site, alternating between sites during the winter season.

Boreal Owl Surveys

Nine census routes were surveyed for boreal owls at both study sites using playback of tape recorded calls. A total of 37 night-time surveys produced 22 separate locations of territorial male boreal owls. Many of the calling owls were too distant to pinpoint their location; however, seven locations at Chamberlain Basin and five at Cold Meadows were close enough to determine the forest stand being used.

Prior to 1984 boreal owls had not been documented at Cold Meadows. The large number of owls located in 1984 indicates that the Cold Meadows area supports a breeding population of owls. The existence of the Cold Meadows population supports the hypothesis that the boreal owl population in the RNRW is not limited to a small isolated population in the Chamberlain Basin region.

The distribution of territorial males at both study sites was not uniform. Calling owls were never heard in the extensive stands of lodgepole pine found at both sites. Of the 12 most accurate locations, eight were in stands dominated by 20-36" DBH ponderosa pine (Pinus ponderosa) and Douglas fir, two were in stands dominated by large Douglas fir, and two were in stands of mature Engelmann spruce (Picea engelmannii)- subalpine fir (Abies lasiocarpa). Spruce-fir habitats, however, were under-represented on survey routes as few stands of extensive spruce-fir forest occur in the vicinity of either the Chamberlain Basin or Cold Meadows facilities.

Radio Telemetry Studies

Radio telemetry studies aided in the investigation of specific habitat use patterns of individual owls and location of nest sites. Difficulties encountered in trapping owls at Cold Meadows prevented us from outfitting owls with radio transmitters at that study site. Radio telemetry studies in 1984, therefore, were limited to owls in the Chamberlain Basin region.

Ten boreal owls were captured 21 times using mist nets and bal-chatri traps, and nine of these were outfitted with radio transmitters. The period which these individuals were followed varied from five minutes to eight months (Table 1). Four owls were outfitted with new transmitters in September 1984 to allow continued monitoring of these birds in 1985. Through long term monitoring of the owls' activities, both seasonal and year to year variation in habitat use can be studied.

Radio tracking eight owls from January through September 1984 resulted in 97 roost site locations. Data was collected at roost sites to describe forest stand structure, habitat type, and the roost tree used by the owl. Portions of these data were collected during summer months (for both winter and summer sites), including tree density and size class, basal area, and percent canopy cover. Individual owls roosted in a variety of forest types, and virtually all forest types available were used for roosting by boreal owls.

Roost locations were also valuable as indicators of home range use patterns. Roost sites were not used repeatedly by individual owls. Instead roosts used on consecutive days were an eighth to three quarters of a mile apart. On several occasions owls were found at their roost with a prey item. We are inclined to believe that the area chosen for roosting may simply be the end-point of an owl's nightly foraging activity. The specific tree chosen for roosting, however, will likely be selected to meet the needs of concealment from predators and protection from extreme weather conditions. The distribution of roost locations, then, should be useful in estimating the area used by an individual owl for foraging (home range).

The total area used by individual owls from winter through summer was quite large. The area encompassed within roost locations for the three owls which were located most often covered 1214 ac and 3472 ac for two females and 1092 acres for a male. Each owl used much of the same area in winter and summer, however, there was some shift toward use of higher elevations during summer months.

Areas used by mated male and female boreal owls overlapped extensively. More interesting, however, the home ranges of adjacent pairs overlapped considerably. Some forest stands were used by four radio marked owls at different times; of course, additional overlap in use by unmarked birds is unknown.

Nesting and Breeding Biology

Following radio marked owls was the most successful method for locating boreal owl nest sites. Of eight owls followed during the breeding season, five nested, including two mated pairs. A nest site at Cold Meadows was located by observing an unmarked female peering from the nest cavity. Data on forest stand structure, topographic features, and habitat type were gathered at each of the four nest sites. Nest tree characteristics were also recorded.

The four boreal owl nests all occupied abandoned pileated woodpecker cavities. Large ponderosa pine snags (31, 32, and 35 inches DBH) were used by three nesting pairs while the fourth nest cavity was in a live ponderosa pine with a dead top. These nest sites each occupied open, uneven-age, mixed-conifer stands dominated by overmature Douglas fir and ponderosa pine. Three stands at Chamberlain Basin were classified as Douglas fir/pine grass habitat types (Pseudotsuga menziesii/Calamogrostis rubescens, Psme/Caru) while the Cold Meadows site was subalpine fir/pine grass (Abies lasiocarpa/Calamogrostis rubescens, Abla/Caru).

Three nest sites at Chamberlain Basin were monitored from early incubation through fledging to determine nesting dates,

reproductive success, growth rates of the young, daily activity pattern, and to collect prey information. Beginning when young hatched, nest trees were climbed every five to seven days to measure the young and gather prey remains. The daily activity pattern was closely monitored at one nest using an automatic event recorder triggered by a perch placed across the bottom of the nest cavity entrance. In this way, the time and number of prey deliveries were recorded for 48 days.

Prey Base Studies

Prey remains were collected from three nest cavities on 18 occasions. These data combined with prey identified from 40 pellets collected beneath roosts will be analyzed to determine seasonal food habits of the boreal owls. Ultimately, the prey information will be valuable in inferring foraging habitat of the owls through knowledge of the habitat use of various prey species.

Based on nest observations and pellets dissected to date, boreal owls seem to prey primarily on the redback vole (Clethrionomys gapperi) and, in the nesting season, pocket gophers (Thomomys talpoides). In addition, boreal owls ate deer mice (Peromyscus maniculatus), shrews (Sorex spp.), jumping mice (Zapus princeps), voles (Microtus spp.), and an occasional bird.

Small mammal trapping grids established on four sites estimated the relative density of shrews, mice, and voles in sagebrush, wet meadow, lodgepole pine, and mature, mixed-conifer vegetation types in early spring. Snap trap grids of 90 traps at 15 meter spacing were run for six to nine nights in one relatively homogeneous stand of each vegetation type.

Logistics

Preparations were made at Chamberlain Basin and Cold Meadows so two or more biologists could safely live at each camp during winter 1985. Food supplies sufficient for two biologists for three months were cached. In addition to leftover fuel supplies from 1984, two cords of fuel wood were hauled and cut, using crosscut saws, and stored at Chamberlain Basin as well as three quarters of a cord at Cold Meadows. Clothing, bedding and research equipment was also stored at each camp. Radio telemetry receivers and radios, cassette tape players, bal-chatri traps, mist nets and other equipment are being repaired.

Table 1. Period which nine radio-tagged owls were monitored during 1984 at Chamberlain Basin in the River of No Return Wilderness, Idaho.

Boreal ID Number	Sex	Monitoring Period	Transmitter Fate	Number of Roost Locations
BO31	M	30 March-22 Sept.	Radio stopped	6
BO33*	M	16 March-Present	3rd radio mounted	11
BO34*	F	31 Jan.-Present	4th radio mounted	17
BO37	F	5 Feb.-Present	3rd radio mounted	22
BO42*	M	15 Feb.-Present	3rd radio mounted	19
BO43	M	15 Feb.-5 July	Radio removed	7
BO44	F	15 Feb.-15 Feb.	Radio stopped	0
BO55*	F	19 March-7 July	Radio stopped	11
BO58*	F	21 March-2 July	Radio stopped	4

*Individuals that nested in 1984.